

Including the non-energy benefits of energy efficiency in the investment assessment and decision-making process

Pilot assessment M-Benefits

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Pilot assessment M-Benefits

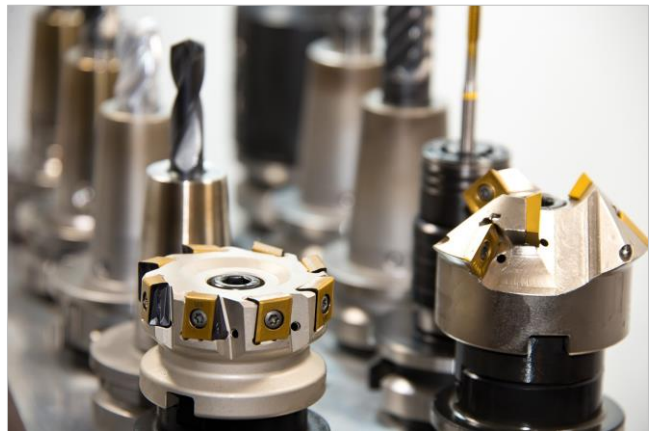
IND-11

High precision mechanical work
company

Modification of the washing
process of the milling washers

M-Benefits analysis carried out by UNIL (Dr Catherine Cooremans), in collaboration with the company's management, who approved this presentation.
We would like to thank the company for their collaboration on the M-Benefits research project.

The name of the company is withheld for reasons of confidentiality.
All information and figures are real and accurate.

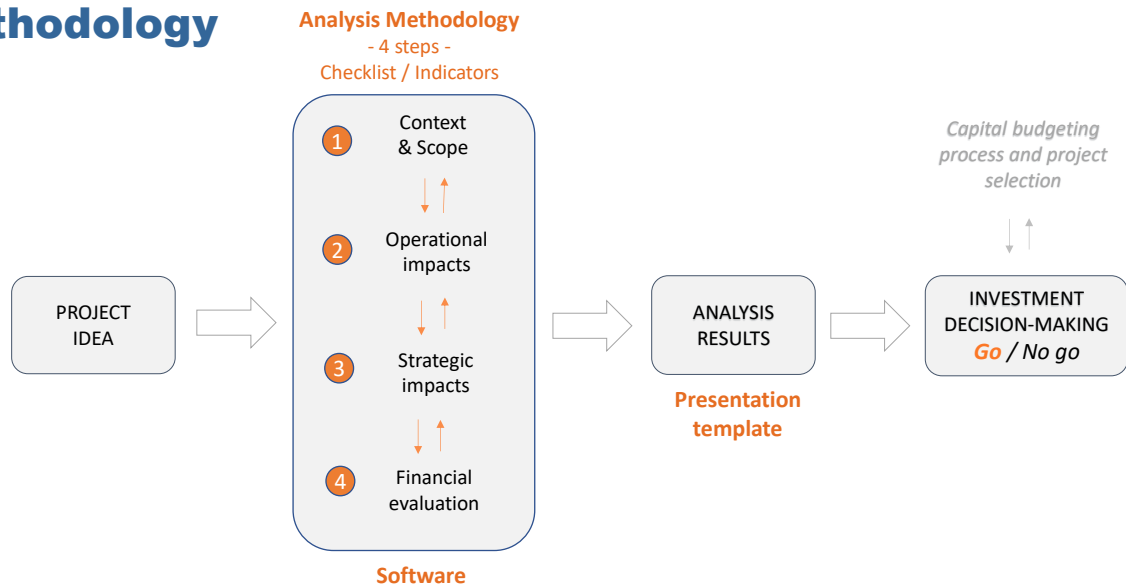


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Analysis Methodology



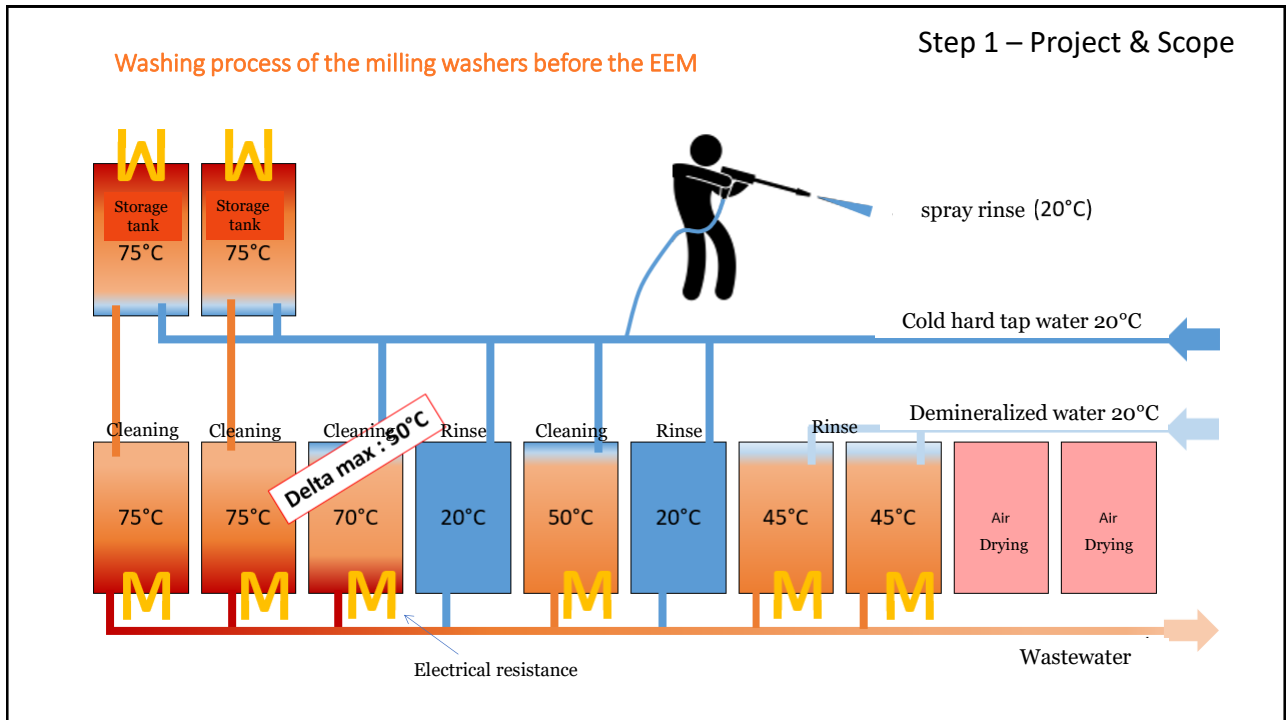
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Step 1 – Project & Scope

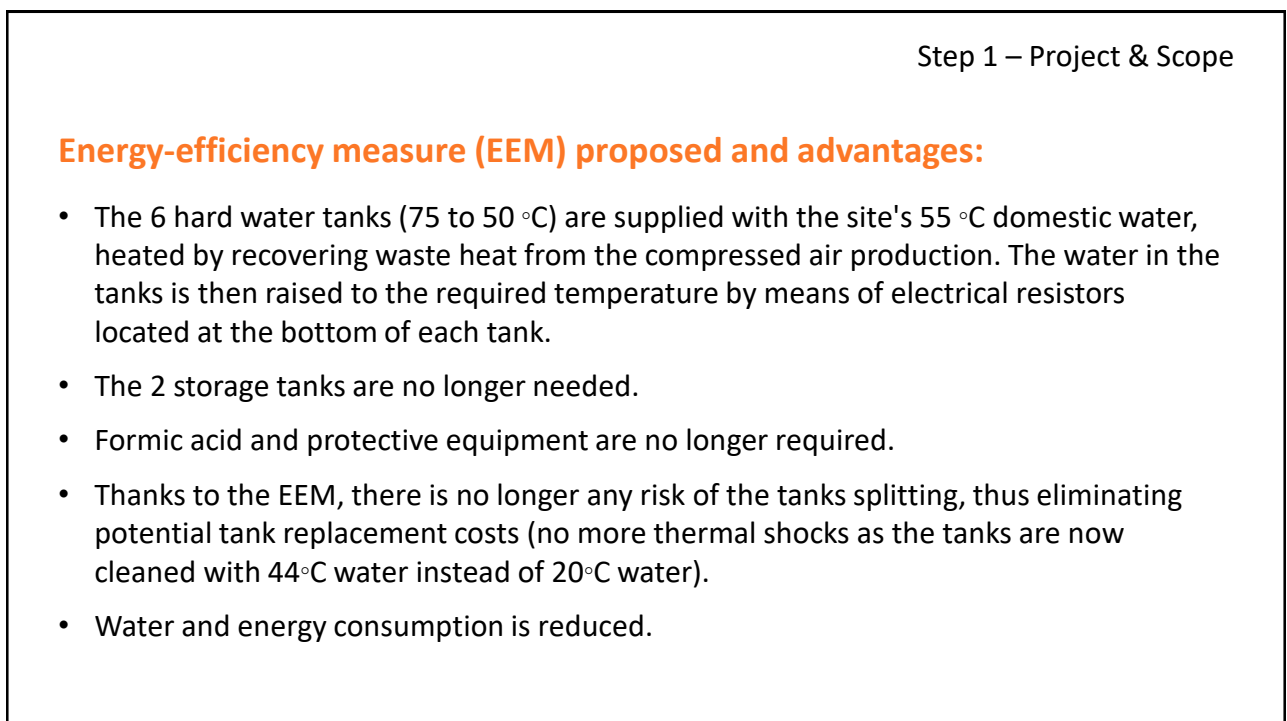
Current situation and weaknesses (see diagram on the next slide):

- After milling, the metal parts are cleaned and rinsed by passing through tanks filled with water.
- 2 storage tanks, 4 washing tanks and 2 rinsing tanks are supplied with city water at 20°C. The water is then brought to the desired temperature (45 to 70°C) by electric resistors located in the bottom of each tank.
- 2 storage tanks store water at 75°C and supply it to the first 2 cleaning tanks to save time in heating the water. 1-2 times a day the cleaning tanks are emptied, cleaned with cold water and then refilled with cold water.
- Cold water creates thermal shocks that can cause the tanks to crack and require emergency replacement.
- The storage tanks are cleaned once a month with formic acid, a lethal chemical, to remove accumulated limescale.

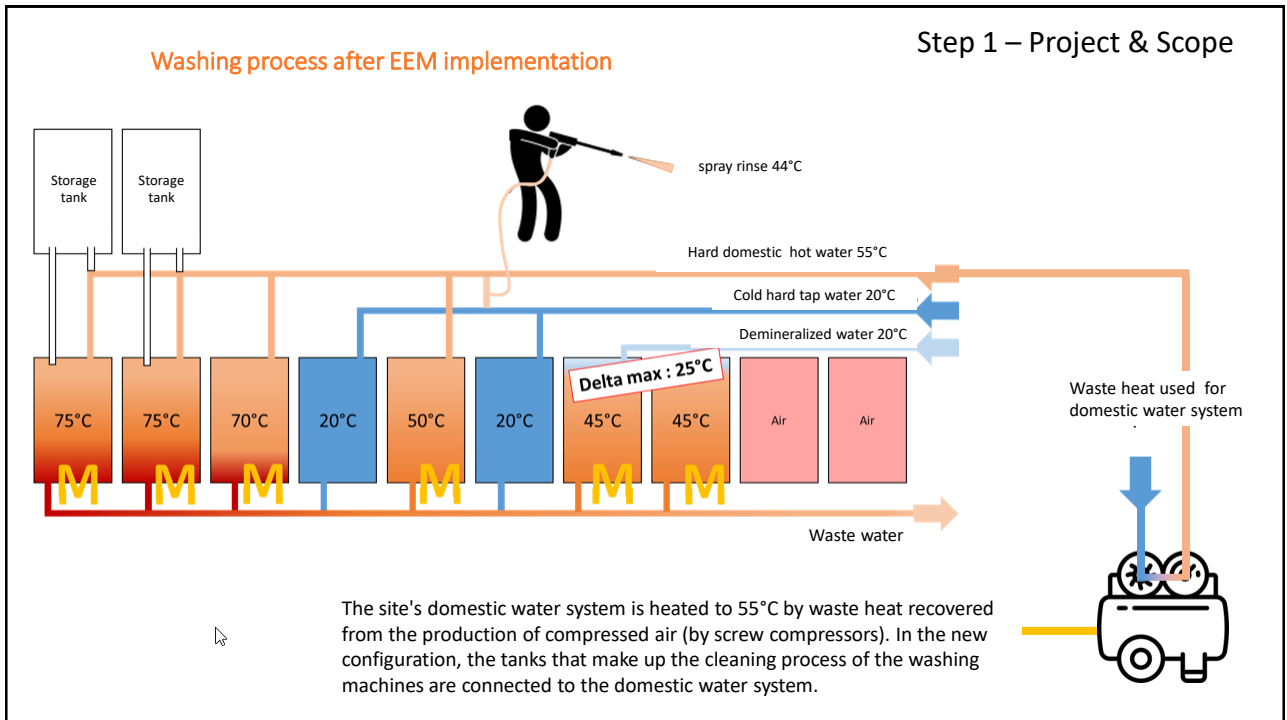
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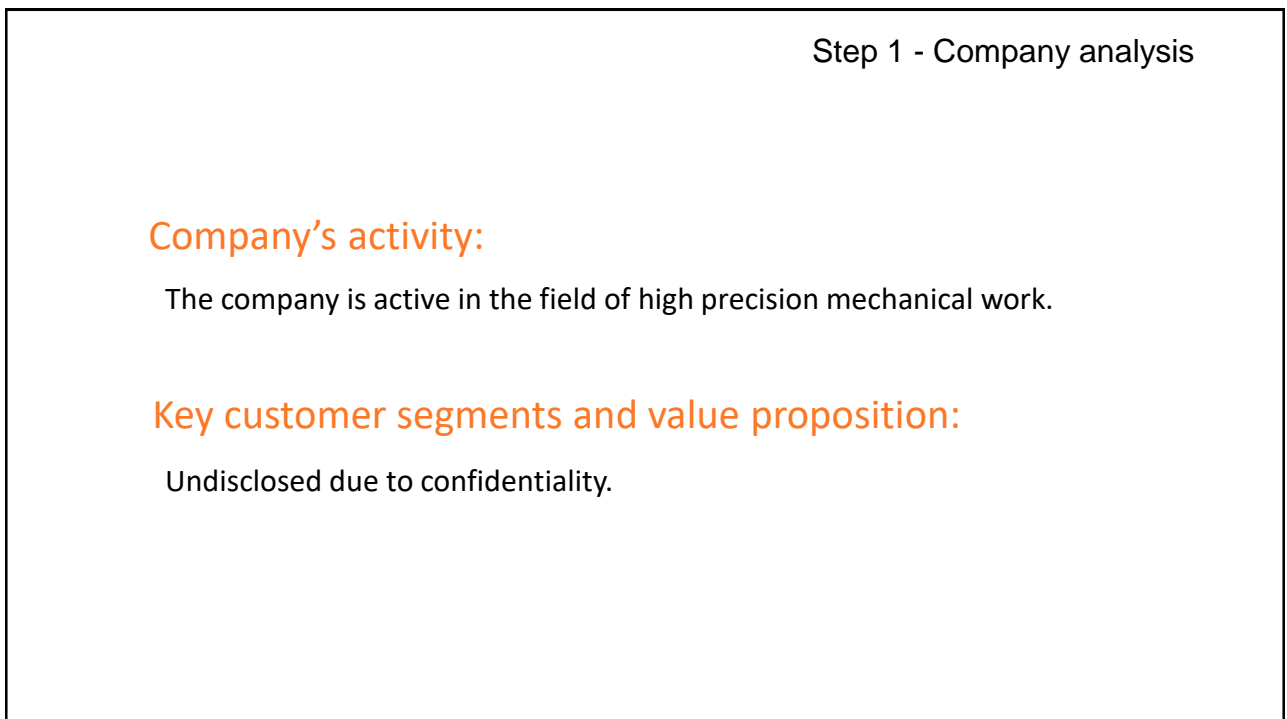
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Step 2 - Energy & operations

Energy analysis

Current energy consumption:

- Energy carriers impacted by the project: Electricity.
- Consumption for the 3 washing lines concerned: 130'500 kWh/year.

Future energy consumption (after EEM implementation)

- Estimated physical savings for the 3 washing lines: 63'000 KWh/year.
- Estimated financial savings (energy only): 2'400 CHF/year.
- Improvement of total site energy consumption: *undisclosed due to confidentiality.*
- Impact on indicators of energy performance: *undisclosed due to confidentiality.*

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Step 2 – Energy & operations

Operational Analysis – Expected project impacts on operational excellence:

- Increased **staff** safety: A lethal chemical - and all the risks associated with it - is removed from the plant.
- Improved **quality** and reliability of the washing process by reducing the risk of disruption due to tank cracking. No impact on product quality.
- Reduced operating **costs**: Equipment, water, energy, waste, maintenance.
- Less **time** is needed for tank cleaning (the two 75°C water tanks are no longer necessary).

The 4
DIMENSIONS
of
OPERATIONAL
EXCELLENCE

Safety

Quality

Costs

Time

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Step 4 – Financial analysis

Financial analysis

Energy benefits (EBs) only:

- CAPEX: 30'000 CHF
- Annual investment in-flow: 2'415 CHF
- NPV: **-11'483 CHF**
- IRR: **-7.5%**
- Simple payback: 13 years

All benefits (EBs + NEBs included):

- CAPEX: 30'000 CHF
- Annual investment in-flow: 6'413 CHF
- NPV: 5'895 CHF
- IRR: 11.5%
- Simple payback: 4.7 years

Discount rate: 6 %

Investment duration: 8 years (i.e. the number of years taken into account to compute NPV and IRR).

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Conclusion

Why this project is worthwhile:

- Increased **safety**: a lethal chemical – and all related risks – is removed from the plant.
- Increased **reliability** of equipment and facilities because of reduced breakdowns.
- Increased **productivity** due to less time spent cleaning and replacing tanks (when splitting).
- Reduced operational **costs**: equipment, water, energy, waste, maintenance.

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